CANADA'S FISHERIES

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How many school pupils—or older folk, either, for that matter—know that Canada was once called "Bacalaos"? Not very many. But "Bacalaos" was the name given the mainland of North America by John Cabot when he first sighted the country in 1497 or 1498. "Bacalaos" was really the Basque word for "codfish" and Cabot thought it suitable to the New Land since off the coast he found Basque fishermen from Spain and France carrying on a large cod fishery.

The fishing industry, indeed, is the oldest industry of the land that is now Canada. There is good reason to believe that in days long before the time of Columbus and Cabot there were European vessels fishing off the Atlantic shore of this country. When Jacques Cartier sailed up the St. Lawrence in 1534 he found that fishermen from the Old World had been there before him. Sydney harbour, in the island of Cape Breton, was once known as "Spanish Bay," and owed that name to Spanish fishermen, who, with French and Portuguese, frequented the waters off the island several centuries ago. In 1599 French fishermen established a base at Tadoussac in Quebec and four years later a grant of the fisheries of Canada was made to Sieur de Monts by the King of France.

WORTH MANY MILLIONS

That was a long time ago. Nowadays the fish caught by Canadian fishermen are worth between fifty and sixty million dollars a year! A hundred foreign countries buy fish and fish products from the Dominion, and in 1928 they paid Canada more than $38,000,000 for what they bought. Something like 80,000 Canadians are at work in the fishing industry each year—catching fish, drying and curing them, pickling them, canning them, making fish oil and fish glue and fish meal. It is to be remembered, too, that in addition to the Canadians who are employed in the fishing industry itself there are a great many others who get work and wages because the fishery is carried on; for instance, there are builders of fishing vessels and boats, makers of rigging and other gear, men who work at manufacturing gasolene engines, net-makers, people who find employment in making oilskins and rubber boots and other clothing the fishermen must have, the men who make barrels and casks and cans and other containers in which fish are packed for market, and the railwaymen and other transport workers who handle the many millions of pounds of Canadian fish that are marketed every year. An industry which, directly and indirectly, makes work for so great a number of people must obviously be of prime importance to Canada.

Of course, the fishing industry was bound to grow. The Dominion's fishing grounds are perhaps the most extensive in the world and the waters are so pure and cold that the fish which inhabit them are unsurpassed anywhere in quality

—a fact which is of special importance since scientists have found that fish contain elements which make them among the most nourishing and healthful of foods. Canada's Atlantic coast line, from Grand Manan in New Brunswick northward to Labrador, measures more than 5,000 miles, and fish are to be caught along almost every mile of it. In the bay of Fundy, the gulf of St. Lawrence, and other waters there are over four-fifths of the total area of the fishing grounds of the North Atlantic, or some 200,000 square miles. Then, too, in Hudson bay, with a shore line 6,000 miles in length, there is a water area greater than that of the Mediterranean sea, but as yet the value of the fisheries resources of the bay has not been determined. On the Pacific the coast of the Dominion measures nearly 7,200 miles in length and the waters teem with salmon and many other fish. But even these facts as to the sea fishing grounds do not tell all the story of the extent of Canada's commercial fishing waters for in the lakes of the country there is more than half the fresh water of the globe, and from these lakes great quantities of fish are sent to market every year.

The commercial fisheries of the Dominion fall into three main divisions—the Atlantic Fisheries, the Pacific Fisheries, and the Inland Fisheries. The Dominion authorities control the fisheries in the tidal waters of the Maritime Provinces and British Columbia, the fisheries of the Magdalen Islands in Quebec province, and the fisheries of the Prairie Provinces and the Yukon Teritory. The non-tidal fisheries of New Brunswick and Prince Edward Island, all the Quebec fisheries except those of the Magdalens, and the fisheries of Ontario are under provincial control, but those of the non-tidal waters of Nova Scotia are administered by the Dominion, though the fisheries regulations for all sections of Canada are made by the Dominion, or federal, authorities. It is to be noted, however, that though the Dominion controls the fisheries of the three Prairie Provinces at present (January, 1930), control of the fisheries of Manitoba and the fisheries of Alberta is to pass to the respective provincial authorities under agreements recently made by the Dominion with these two provinces in regard to their natural resources.

THE ATLANTIC FISHERIES

By the term "Atlantic Fisheries" there is meant the sea fisheries of the Maritime Provinces and Quebec. More than thirty different kinds of fish and shellfish are taken by Atlantic coast fishermen. The chief varieties of fish are cod, haddock, hake and cusk, halibut, herring, mackerel, alewives or gaspereau, pollock, sardines, salmon, smelt, and swordfish, and the principal shellfish are lobsters, oysters, scallops, and clams.

Lobsters are taken in the waters of all four of the Atlantic provinces but the largest production is in Nova Scotia. Oysters are taken only in the Maritime provinces and scallops chiefly in Nova Scotia, though some are landed in New Brunswick, Quebec, and Prince Edward Island. The largest production of clams is in New Brunswick but they are also landed in all the other Atlantic provinces. Lobsters are caught by means of baited lobster traps or "pots," devices made of laths and pieces of net fastened together, which are sunk at suitable spots by the lobstermen and are lifted at more or less regular intervals so that the catch may be removed. Oysters are gathered by special rakes or tongs from "beds" found in various bays and river estuaries where there is a proper mix-

ture of fresh water. Scallops are found in deeper water of sea saltiness and are landed by dredges drawn by motor boats. Clams are dug at various places along the shore.

Cod, haddock, hake and cusk, herring, mackerel, and salmon are taken by the fishermen of all four provinces, with Nova Scotia's catch the largest in most cases. Swordfish are taken in Nova Scotia waters only, pollock and alewives by Nova Scotia and New Brunswick fishermen, and halibut in all the Atlantic coast waters save those of Prince Edward Island. Smelts are caught by the fishermen of all four provinces but by far the greater production is in New Brunswick, where in Northumberland county waters alone as much as three and a half million pounds is sometimes landed in a year.

Canada's Atlantic coast waters, it may be noted incidentally, yield about three-quarters of the world's annual production of smelts. The smelt fishery is at its height in the winter months when the fish come into the rivers from the sea to spawn. At that time enormous catches are made in tidal rivers which the fish frequent. Holes are cut in the ice and the fish are mainly caught in bag nets.

Virtually all the sardines taken on the Atlantic coast are caught in south-western New Brunswick where the largest sardine canning factory in the British Empire is successfully operated. These fish are caught by means of weirs and seines and the year's catch in New Brunswick sometimes runs nearly to thirty-five million pounds.

METHODS OF FISHING

The Atlantic Fisheries may be described as in two divisions—the shore, or coastal, fishery and the deep sea, or " banks," fishery. Generally speaking, the shore fishery is carried on in the waters within twelve miles of land by small sail and motor boats but some larger boats, which may be classed as small vessels, operate fifteen miles or so off shore. Hand lines and trawl lines, or " long " lines, are used in the shore fishery, as well as gill-nets, seines, traps, and weirs.

When fishing for such fish as cod, haddock, and halibut the boat fishermen and the fishermen in the small vessels use either hand lines or " long " lines. The hand line is a single line with one or more baited hooks and is weighted by a lead sinker. The line is thrown over the side of the boat or vessel and then is pulled up when fish are felt tugging at it. Several lines may be handled by one fisherman. A trawl line or " long " line has attached to it at intervals of about six feet a succession of single short lines, each with one hook. Sometimes several of the " long " lines are tied together so that a line of a mile or more in length is made. When the hooks have been baited and the " long " line placed in the water it is buoyed and anchored at both ends and left stationary for some time. Then it is pulled in when the fish are taken from the hooks and the line may be set again. The bait used both in hand line fishing and with " long " lines is usually herring but clams are sometimes used while squid, a kind of cuttlefish, makes an excellent bait when obtainable.

Gill nets take their name from the fact that they catch and hold the fish by the gills. These nets, which are made of twine, are " set " in the water in the form of a wall of netting. Several nets are often tied together and some-

times as many as forty are used in this way. Sinkers of lead or stone at the bottom of the net and corks or floats at the top hold the wall of netting vertical in the water. As fish swim along and seek to find passage through the meshes in the net they are caught by the gills and held until the fisherman pulls up the net and removes them. The meshes in different gill-nets vary in size, of course, for the mesh which would catch one variety of fish would be too large or too small to hold other varieties.

Seines are nets, but, unlike gill nets, they are not "set" or anchored but are used to enclose moving bodies, or "schools," of fish. When a "school" is sighted by the fishermen the seine is put out, run around the fish, the two ends of the net are brought together, and the bottom is drawn in so that the fish are completely enclosed. Then the seine is gradually drawn to the top of the water and the fish are dipped into the boats or unloaded direct from the seine. This method is called "purse-seining," and is operated in the deep off-shore waters, chiefly for the capture of mackerel. "Drag-seines" are operated for the capture of herring and mackerel that approach close to the shore. The seine, a long net, is run out around the body of fish, then the ends of the net are brought to the shore and the whole is dragged in, bringing the fish with it.

Fishing traps vary more or less in design but all are similar in plan. Each trap consists of a wall or "leader" of net which tends to divert swimming fish toward a "pound" or trap of netting or other material; and once within the "pound" the fish rarely find the way out. At suitable times the fishermen go to their traps and take out what fish may have been caught.

Weirs, which run out from shore, are devices made of small poles or posts and brushwood and nets. A "leader," made by driving a connected series of posts into the bottom and fastening brushwood, netting, etc., along the sides, is built out into the water and at the outer end is a bag or trap, usually circular in shape, which is made by another series of posts to which a net is fastened on the inside. As the fish swim along near the shore they are guided by the "leader" through a narrow opening into the trap and their escape through the opening again is prevented by projecting partitions.

ON THE "BANKS"

The deep sea fishery is often called the "banks" fishery because it is largely carried on in waters which cover those "banks" or upland and hill portions of the ocean bottom that are found between the outer edge of the shore fishery area and the deep waters of the Atlantic. The main "banks" range from the Grand Bank, southward of Newfoundland, to Georges Bank, off the southwestern coast of Nova Scotia. Twelve of them have a combined area of nearly 70,000 square miles. A number of smaller "banks" are also fished by Canadian fishermen.

Deep sea fishing vessels are sturdy sailing craft, many having auxiliary engine power, which must be capable of withstanding very stormy weather. They range in size from vessels of some seventy tons to vessels of more than one hundred and twenty-five tons and they carry crews of from fourteen to twenty-five men.

Fishing in deep sea waters is also carried on to some extent by otter trawlers—really steam vessels which operate by dragging " trawls," or specially constructed strong bag-like nets, through the water behind them.

Steam-trawling, or otter-trawling, is carried on by steam vessels of from 250 to 300 tons gross, which are similar in the nature and arrangement of their gear. The trawl is a large conical net or bag about 150 feet in length, which is towed along the bottom of the sea. The mouth of this huge bag is kept open laterally by boards or " doors " or short wooden walls, one on each side, which are rigged in such a way that they operate like kites. As the trawl is towed along, these " doors " are pulled apart by the resistance of the water, thus opening the bag. The lower side of the mouth of the bag, which rests on the sea-bottom, is secured to a line reaching from " board " to " board." The upper side of the bag is secured to a somewhat shorter line, and, thus, as the bag is towed along, the top portion of its mouth extends considerably in advance of the lower portion. The " boards " are heavily shod and reinforced with iron. At ordinary towing speed their kite-like action extends the net laterally to a width of over 100 feet, and the flow of water into the net tends to keep it open vertically. In the forward third of the bag the mesh of the net is largest; in the centre third, smaller; and in the last, or end, third, smaller still. The end of the net is open, but is closed, when fishing, by a draw-string. In operation, the trawl or bag is towed slowly along the sea-bottom at a speed of three or four miles an hour, usually for a fishing period of from one to two hours. Fishing goes on day and night. At the end of each fishing period the trawl is raised over the deck by a winch, the draw-string in the end of the bag is loosed, and the fish are dumped on the deck, sorted and packed in ice in the hold, in boxes or " pens."

The fish taken in the deep sea fishery are principally cod, haddock, hake, and pollock, and they are caught in the main for the dried fish trade. For the most part the " long " line method of fishing is used. Each vessel carries from six to ten small, flat-bottomed boats called dories, and when fishing is to begin the dories are put overboard, each manned by two fishermen. As the line is being set one man pays it out from the dory as the other rows the boat, the hooks having been baited before the men left the vessel. One end of the line is fastened to a small anchor and buoy and when the " long " line, with its five or six hundred short lines, has all been paid out the other end is also fastened to a buoy and anchor. After allowing the line to remain in the water for a half an hour or more the men haul it into the dory, taking off the fish as the short lines come in. Then the dory goes back to the vessel, the fish are unloaded, the line is rebaited, and fishing is resumed again. After fishing for the day is all over the crew are employed in splitting, cleaning, and washing the fish and storing them in the vessel's hold, where each layer is heavily sprinkled with salt. The fishing continues day after day until a full cargo has been obtained, when the vessel sails again for port, after having remained on the fishing grounds sometimes for as long as two months. Back at port, the fish are unloaded and are dried in the sun and air, a process which requires about three weeks, or, in some cases, the drying is partially done in artificial fish driers which require much less time.

MARKETING THE FISH

The value of the fish and fish products marketed from the Atlantic fisheries every year is more than $20,000,000. Many of the fish are marketed fresh, or in frozen form, in Canada and the United States, and some even in Europe. A process known as "rapid freezing," by which fish are frozen very quickly in tanks by means of a brine mixture, is now expanding the business in frozen fish, and it is expected to lead to much greater expansion since fish frozen by this method will keep for months, if properly handled, without losing any of the fine flavour and firmness of tissue which mark them when first taken from the water. In Canada a "rapid freezing" process has been developed by the Atlantic Fisheries Experimental Station at Halifax, which is maintained under Dominion Government auspices. The increasing use of the process will mean that Canadian fresh fish will be available regularly to people in the inland districts of the Dominion and may be successfully exported in large quantities to foreign markets.

Great quantities of such Atlantic coast fish as cod, haddock, hake, cusk, and pollock are dried for market and a very large trade in dried fish is done with the West Indies and other southern islands, Brazil, the United States, Italy, Portugal, etc. Much fish is also sold in smoked and pickled forms; for example, smoked herring, haddock, salmon, cod, pollock, and alewives and pickled herring and mackerel. Another branch of the Atlantic fishing industry is the production of filleted fish; that is, the fillets, or portions, of such fish as cod, haddock, hake, cusk, and pollock from which the bones have been removed.

A very large business in lobsters is done on the Atlantic coast, which is the only part of Canada where lobsters are caught. The average annual pack of canned lobsters in the Maritime Provinces and Quebec in the past five years (1925-29)—reckoned by 48-pound cases—has been about 120,000 cases. A form of marketing which has been growing larger of late years is the sale of fresh lobsters in the shell. They are sold on the Canadian market and in the United States. The canned lobsters are marketed in the Dominion, the United States, Great Britain, France, Germany, and several other countries.

Lobster canning is the main fish-canning industry in the Atlantic coast provinces in point of value of output, but there is a large and increasing production of canned sardines in New Brunswick. Clams are canned in considerable quantities in different parts of the Atlantic provinces and there is production also of canned salmon, canned scallops, canned cod, canned haddock, etc. The value of the canned lobster pack now averages about $3,200,000 a year and the sardine pack has a value of $1,000,000 and more.

Medicinal cod liver oil, cod oil, fish meal, fish glue, and fish oil are by-products of Atlantic coast fishery operations, while quantities of certain varieties of fish are used by fishermen for bait and some use is made of waste fish for fertilizer. Fish oil is used in the manufacture of soaps and the tanning of leather and for other purposes. Fish meal is being increasingly used by poultry raisers and farmers and dairymen as a food for their animals since it has been found to be an especially good feeding material.

Cod liver oil, of course, is very valuable as a medicine and a health and body builder, a fact which is traceable to its remarkably high vitamine percentage.

THE INLAND FISHERIES

The Inland Fisheries are carried on principally in Ontario, the three Prairie Provinces, and Quebec, but there are also small-scale operations in the Yukon Territory, New Brunswick, and British Columbia. Inland production has been increasing in value in recent years and in 1928 it amounted nearly to $8,400,000, with Ontario accounting for almost half the total sum. Manitoba ranks second in point of value of production, Quebec third, with Alberta very close behind, and Saskatchewan fifth.

Ontario's commercial fishing is carried on in lake Ontario, lake Erie, lake Huron and Georgian bay, lake Superior, lake St. Clair, lake of the Woods and the waters of the Kenora and Rainy River districts, the Niagara river, the St. Lawrence, the Detroit river, and such interior waters as lake Nipigon, lake Nipissing, and lake Simcoe. The principal varieties of fish marketed are trout, whitefish, herring or ciscoes, pickerel or dore, perch, tullibee, blue pickerel, pike and sturgeon. In Ontario, as in the Prairie Provinces, virtually all of the commercial fishing is done by means of nets, with gill nets largely predominating.

IN PRAIRIE PROVINCES

In the Prairie Provinces the whitefish catch is first in importance, so far as value on the markets is concerned, and is worth something like a million and a quarter dollars every year. Large landings of whitefish are made in all three provinces—Manitoba, Saskatchewan, and Alberta. The other principal fish taken in all three provinces are tullibee, pike, pickerel, and trout. Carp, catfish, goldeyes, mullets, perch, saugers, and sturgeon are also caught in different parts of the provinces, but not all of these varieties are taken in each province.

The chief fishing waters of Manitoba are lake Winnipeg, lake Winnipegosis, lake Manitoba, lake Dauphin, lake St. Martin, and lake Waterhen, but the fishery is also carried on in many other lakes and in a number of rivers such as the Churchill and the Nelson. The larger part of the Manitoba catch is landed in the winter time, when fishing is done through the ice.

By far the greater part of Saskatchewan's catch is taken during the winter. Among the chief fishing areas of this province are the Peter Pond lake district, the lac la Ronge district, Montreal lake district, Dorè lake district, Ile à la Crosse district, and the Jackfish lake and Turtle lake countries but the fishermen operate also in a number of other sections as well. In Alberta the more important fishing territories are in the Cold lake, Athabasca, Lesser Slave lake, Trout lake, and Pigeon lake districts, but there is fishing in various other areas as well.

In all three Prairie Provinces additional fishing waters are yearly being opened up as railway extension goes ahead and development of new country is pushed forward. Fish are believed to exist in commercial quantities in numbers of lakes which are yet too isolated for successful exploitation, and the outlook is that the next few years will see considerable enlargement of fishery production in the three provinces.

Much of the fish taken from Canada's fresh water areas is marketed in the Dominion but there is large exportation to the United States, both of fresh

fish and frozen fish. An interesting fact in connection with the Prairie Province fisheries is that fish from as far north as lake Athabasca are successfully marketed in Chicago and other United States cities.

THE PACIFIC COAST FISHERIES

Salmon is first in importance among the fish of Canada's Pacific coast and it is salmon production which is the main factor in giving British Columbia the leading place among the provinces so far as the yearly value of the fisheries is concerned. In 1928, for instance, British Columbia fish and fish products accounted for forty-eight per cent of the value of the Dominion's fisheries production, as compared with thirty-two per cent in the case of the Maritime provinces, seven per cent for Ontario, seven per cent for the Prairie Provinces and the Yukon together, and six per cent for Quebec. In that year the total marketed value of British Columbia's fisheries production was nearly $26,600,000 and the value of the salmon production made up $17,345,000 of this sum.

Five principal varieties of salmon are caught by British Columbia fishermen: The Sockeye, which lives for four or, sometimes, five or six years and weighs, on the average at maturity, about five pounds; the Spring, which lives for six or seven years and reaches an average weight of some twenty pounds; the Coho, whose life span is three years and average weight six pounds; the Pink, which lives only two years and comes to weigh about four pounds; and the Chum, whose life is three or four years and average weight eight pounds. Like the Atlantic salmon, though of an entirely different genus or kind, the Pacific salmon go up rivers and streams from the sea to spawn but, unlike the Atlantic fish, which go back to sea after spawning and then in due season return to fresh water to reproduce again, they spawn once only and then die immediately at the spawning grounds. All of the principal varieties of Pacific salmon are very similar in food value—and they are exceptionally good foods—but Sockeye command the highest price on the market, largely because their rich, red colour and the firmness of their tissues give them an especially attractive appearance on the table.

Save for the month of December, which, generally speaking, is a "close" season, salmon fishing is in progress in British Columbia throughout the year, though not continuously on any section of the coast, but it is in the summer and autumn months that operations are at their height. The greatest catches are made in the periods when the fish, in enormous numbers, are making their way from the sea to the spawning beds. Salmon are taken by means of gill nets, purse seines, trolls, traps, and drag seines. The use of drag seines, however, which are employed near the mouths of rivers, is only permitted to Indians in certain limited areas. Traps, though much used in the United States salmon fishery, are not permitted in Canadian waters except to a limited extent in the strait of Juan de Fuca, which separates Vancouver island from the state of Washington.

HOW SALMON ARE CAUGHT

Drift gill-nets are more generally used than any other device for catching salmon in British Columbia waters. The nets are similar in construction to the gill-nets used in Atlantic coast fishing, catching the salmon by the gills as they swim along on their migration route to the spawning areas. The net is not "set," however, as is usually done in gill-net fishing on the Atlantic coast, but drifts with the current. It is placed in operation by throwing it over the stern as the fishing boat is being propelled slowly forward. The net is so coiled in the boat that when paid out the bottom is carried down by the lead or sinker line and the cork or float line holds the top on the surface, thus providing a vertical obstruction and the forward movement of the boat leaves the net lying in a straight line. The catch is collected when the net is drawn back into the boat and carefully coiled to throw out again. Gill nets are not suitable for use in the more transparent waters and are usually set in places where the colouring of the water is such that the fish are unlikely to see the meshes of the nets in time to avoid capture. Colouring of the net is also often resorted to in an endeavour to deceive the fish. The nets vary in length up to 1,200 feet, which is the maximum length permitted under the fishery regulations.

The purse seine is a deep net, from 900 feet to 1,200 in length, with cork floats at the top and heavy leads at the bottom to keep it suspended vertically in the water when in use and with ropes and iron rings also at the bottom so that it may be drawn together under water and closed in the form of a purse. The seine is carried at the stern of a motor boat and when fish are seen jumping from the water in numbers which seem to indicate the presence of a "school" one end of the net is thrown overboard and is attached to a stationary row-boat. Then, as the power boat makes a circle around the "school" and back to the rowboat, the crew pay out the net which runs out over a roller. When the seine boat reaches the starting point again the two ends of the seine are brought together and a pull on a rope which runs down through the iron rings at the bottom of the net "purses" or closes the seine, preventing the escape of the fish. The net is then gradually drawn back on the boat until the fish are in a confined space in the small portion of the "pursed" net left in the water. They are then easily dipped out and dropped into the vessel's hold.

Trolling is simply fishing by means of hooks and lines from power boats, or from rowboats propelled forward at slow speed. In the motor boat fishing several lines may be used, sometimes as many as six. Where several lines are used some will be trailed directly from the stern of the boat and others at intervals from poles so adjusted as to project over the boat's sides. When a row-boat is used there is trolling by stern lines only. Baited plain hooks are sometimes used on troll lines, but spoon hooks, either baited or unbaited, are more frequently employed. A spoon hook consists of a piece of bright metal, somewhat after the fashion of the bowl of a large tablespoon although of different patterns, to which is attached a hook. It is so suspended on the line that it wobbles or revolves in the water, causing flashing of the bright metal and attracting the fish. The lines may run as long as twenty yards or more and heavy lead sinkers are used to adjust the depth at which fishing is carried on.

Salmon traps are of two kinds, floating and stationary, but in British Columbia only the stationary trap is permitted. The stationary trap is built out from shore in comparatively shallow water and is designed to take advantage of the fact that salmon will try to swim around an obstruction rather than turn back from their course. Since one end of the trap runs to the shore the salmon, coming to a trap, must try to get around the outer or seaward end of the obstruction and in this effort they are caught in other parts of the device.

Traps may vary in minor details but their general plan is as follows: A "leader," made by driving long, heavy poles or piling into the bed of the water and fastening to these poles a fence of wire or net webbing, is built out from shore whatever distance may be necessary. Some extend nearly half a mile. At the outer end of the "leader" is the first of two "hearts" of net, fastened to piling. They are really enclosures with small entrances along the "leader." As the salmon strike the "leader" they turn seaward to get around it and are thus diverted into the "hearts" which are designed to collect and concentrate the fish. The second "heart" lies directly behind the first and is attached to it, serving largely as a safeguard against the escape of fish that have entered the first. Beyond the second "heart" is the "pot," which is the final unit of the trap proper, and the fish, in a last effort to escape along the route they have so far proceeded, find their way into it by means of a very narrow entrance or "tunnel" from the "heart." This entrance is cleverly disguised from the inside of the "pot" and the fish cannot find their way out.

Usually the "pot" is square in form with netting on the sides and bottom. In most traps there are also one or two square enclosures or "spillers" into which the fish may swim from the "pot." When the time comes to remove the fish—"lifting" the trap is the fishermen's phrase—the "spiller" net is raised within a couple of feet of the top of the water, several men in a small rowboat enter the enclosure and gradually pull up the net, thus driving the fish into an end or pocket of the net. A "brailer," or large scoop of heavy netting, operated by power from a fish tender or tugboat alongside, dips out the salmon and drops them into a scow. When the trap has thus been emptied as is done once a day, or once every other day, the tender tows the scow to the cannery or salmon curing plant where the fish are prepared for market.

Drag seines, sometimes referred to as beach seines, are fished from the shore at the mouths of streams. One end of the net, which is not more than 600 feet long, is staked to the shore, and from a boat the remainder is circled around the "school" of fish until the second end has been brought back to the starting point. Lead and float lines keep the net suspended vertically and as the former line rests on the bottom the fish cannot escape the enclosure formed when the net is being dragged shoreward. The net and fish are eventually pulled up on the beach.

A considerable part of British Columbia's annual catch of salmon is sold in the fresh state, some is mild cured, some is salted, and smaller quantities are pickled or smoked, but by far the greatest quantity is canned; in 1928, for instance, slightly more than two million cases of canned salmon, of forty-eight pounds each, were marketed. Exports of canned salmon were sold in some thirty foreign countries.

OTHER PACIFIC FISHERIES

Next in importance to the salmon fishery in British Columbia is the halibut fishery which is carried on chiefly from Prince Rupert and Vancouver. Halibut are taken off the west coast of Vancouver Island, off the Queen Charlotte islands, in Hecate strait, Dixon entrance, and off the coast of Alaska and are caught by hook and line by means of a method similar to that employed in cod fishing on the Atlantic coast. Fishing is carried on from power vessels varying in size from about forty feet to seventy-five feet in length, which may remain on the fishing grounds for as long as two weeks. The catch is kept in good condition by icing. Virtually all of the halibut landed is sold fresh on the Canadian and United States markets.

Very large quantities of herring are also taken by British Columbia fishermen, practically all by means of purse seines similar to those used in the salmon fishery. A small amount is taken by gill nets. The greater part of the catch—in 1928, for instance, over one hundred and seven million pounds—is sold in the Orient after being " dry-salted," a process which consists simply of placing the herring in bins or other suitable receptacles and salting them heavily.

Pilchards, which resemble herring but are larger and possess greater oiliness, are likewise taken in huge quantities on the west coast of Vancouver Island and though many of them are canned the chief use which is made of them is in the manufacture of fish meal and oil. Production of meal and oil from pilchards has become one of the major features of British Columbia fishery operations in the past few years and in 1928 nearly four million gallons of oil and upwards of fifteen thousand tons of meal were marketed. The fish, which are caught by purse-seines, are subjected to steam cooking in what are known as " reduction works," the oil is extracted by pressure and skimming, and the solids are ground into meal by machinery.

Oil and meal are also made from whales, several hundred of which are caught by British Columbia whaling steamers every year, and herring to a limited extent are used in " reduction works " but their utilization in this way is restricted to certain portions of the coast.

The British Columbia fishermen also catch cod, black cod, red cod, ling cod, flounders, skates, soles, crabs, shrimps, and a number of other varieties of fish but in quantities which are small as compared with the production of salmon, halibut, herring, and pilchards. Most of the catches of the less important varieties are sold in the fresh state on the local market.

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